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**Support for  
International Free Electron Laser Conference  
August, 2001**

**Final Report  
AFOSR Grant No. F49620-00-1-0346**

**Principal Investigator:  
Professor Vladimir Litvinenko**

**December 28, 2001**

**Period of Performance:  
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22<sup>nd</sup> International Free Electron Laser Conference (FEL'2000) and 7<sup>th</sup>  
FEL User Workshop,

Duke Washington Inn, Durham, NC on August 14-18, 2000.

Vladimir Litvinenko, FEL Laboratory, Duke University

**ABSTRACT**

This grant was to sponsor the 22<sup>nd</sup> International Free Electron Laser Conference (FEL'2000) and 7<sup>th</sup> FEL User Workshop, which were held at Duke Washington Inn (off-campus) on August 14-18, 2000. The objectives were:

1. to hold successful International FEL Conference at Duke University;
2. provide support for graduate students to attend the conference;
3. provide financial assistance to scientists involved in the MFEL program;
4. attract attention of potential users.

**BACKGROUND**

The Air Force Office of Scientific Research MFEL program is traditional sponsor of International Free Electron Laser Conferences. The resounding success of the 22<sup>n</sup> International Free Electron Laser Conferences was the result of this AFOSR grant amounting to \$15,000.

**DoD AREAS OF INTEREST**

In addition to the intense scientific and technical program, about 200 participants had the opportunity to tour Duke Free Electron Laser Laboratory (DFELL) housing two FELs and the user facilities located in the new two-story Keck Life Science Building. Visitors saw the Mark-III infrared FEL, the 1 GeV Duke storage ring, and the OK-4 FEL generating a wide range of spontaneous radiation, coherent light from the visible to below 200 nm and intense semi-monochromatic  $\gamma$ -ray beams via Compton back-scattering. MFEL users showed their IR and UV FEL based research stations for medical, biological and material sciences.

The conference at Duke University attracted the attention to one of key MFEL facility and increase visibility to the MFEL program, supported by the AFOSR, in the US and world wide.

**PROGRESS:** The 22<sup>nd</sup> International Free Electron Laser Conference and 7<sup>th</sup> FEL User Workshop were held August 13-18, 2000 at Washington Duke Inn & Golf Club in Durham, North Carolina, USA. The conference and the workshop were hosted by Duke University's Free Electron Laser Laboratory. Following tradition, the FEL prize award was announced at the banquet. The year 2000 FEL prize was awarded to three scientists propelling the limits of high power FELs: Steven Benson, Eisuke Minehara and George Neil.

The conference program was comprised of traditional oral sessions on First Lasing, FEL theory, Storage Ring FELs, Linac and High Power FELs, Long Wavelength FELs, SASE FELs, Accelerator and FEL Physics and Technology, and New Developments and Proposals. Two sessions on Accelerator and FEL Physics and Technology reflected the emphasis on the high quality of accelerators and components for modern FELs. The breadth of the applications was presented in the workshop oral sessions on Materials Processing, Biomedical and Surgical Applications, Physics and Chemistry as well as on Instrumentation and Methods for FEL Applications. A special oral session was dedicated to FEL Center Status Reports for users to learn more about the opportunities with FELs. As usual, the oral sessions were supplemented by poster sessions with in-depth discussions and communications. The FEL physicists and FEL users had excellent opportunities to interact throughout the duration of the event, culminating in a Joint Session. The year 2000 was very successful being marked by lasing with two SASE and one storage ring short-wavelength FELs, and by the first human surgery with the use of FEL, to mention but a few. The International Program Committee and chairs of the sessions had the challenging and exciting problem of selecting invited and contributed talks for the conference and the workshop from the influx of abstracts mentioning new results and ideas. Scientists from fifteen countries gave 70 talks, presented 176 posters and submitted 146 papers. We were able to support 38 students and scholars from 11 countries using this grant and additional support from Duke University's Vice Provost for Academic Affairs, Vice Provost for Research and Dean of Natural Sciences.

Statistics on participants of FEL'2000: China – 6, France – 6, Germany – 20, Israel – 5, Italy – 2, Japan – 30, Korea – 4, Netherlands – 6, Russia – 5, UK – 4 and USA – 108. Total collected

registration fees were \$70,655. The support totaled of \$38,718.75. The organizers financial support included the waiving or reducing registration fees, accommodations and, for limited number of guests, the transportation and leaving expenses. We provided the total financial support of \$26,826.96 to 37 participants (~ \$725 per person). The distribution was: France – 2, Germany – 4, Israel – 4, Japan – 2, Korea – 1, Netherlands – 2, Russia – 2, UK – 1 and USA – 19.

Proceedings: The proceedings include 114 refereed papers (600 pages, i.e. the excess is ~ 140 pages) and 33 two-page extended abstracts. Substantial number of the papers (about 35) were published by participants AFOSR MFEL program. Elsevier Science B.V., the publisher of NIM A failed to publish the proceedings in time and we were unable to send the promised copies – THIS WAS THE MAIN REASON FOR THE DELAY WITH THIS REPORT. The complete set of proceedings is available for authors on the FEL'2000 websit: <http://www.fel.duke.edu/fel2000/program/>. We expect to send five hardbound copies of NIM A books with proceedings to AFOSR MFEL program office as soon as they will be available.

Budget: we follow the original budget line very closely. We provided the support (accommodation, reduced conference fees and some per diem) for 16 graduate students: Aggutson, Ron (USA), Al-Shamma, A.I. (UK), Andrews, Heather, (USA), Arbel, Meir (Israel), Bakhtyari, Arash (USA), Blau, Joe (USA), Calderon, Oscar (USA), E. Renault (France), G. De Ninno (France), Neuman, Jonathan (USA), Neuman, Charles (USA), Park, Seong Hee (Korea), Pinhasi, Yosef (Israel), Volokhine, Iouri (Netherlands), Wu, Juhao (USA) and Yahalom, Asher (Israel). The total support for graduate student totals \$9,422.55 compared with budgeted \$ 9,800.00. We budgeted \$1,918.75 for one invited scientist. Using the remaining funds of \$377.45 (budgeted for graduate student support), we provided the support to two scientists from Russia giving invited talks (Nikolay Vinokurov and Naum Ginzburg) totaled of \$2,296.20. The in-direct cost was \$3,281.25 as budgeted.

**Conclusion:** The success of the 22<sup>n</sup> International Free Electron Laser Conferences was the result of the generous AFOSR support. The AFOSR grant provided sufficient support for brining two renown FEL scientist and sixteen graduate student and to make sound scientific FEL conference

program. Ten of eighteen scientists supported by this grant are participating in MFEL program or have direct involvement with MFEL program related research.